Machine Learning for Business Intelligence (DSE)	**4**	**1**	**0**	**3**	**Class XII pass**	**Programming languages, AI/ML Basic Concepts, and Linear Algebra**

Learning Objectives

Data analytics and business intelligence (BI) are very important in today's world. Data analysis is required to understand organisational problems and to explore data. At the same time, business intelligence helps companies make better decisions by showing current and historical data within their business context. Course aims to leverage Data Analysis and Business Intelligence skills to help understand trends and derive actionable insights from data, thus allowing us to make data-driven, strategic and tactical business decisions.

Keywords: Data Analytics, Machine Learning, Management, Social Media, Business Intelligence

Learning Outcomes

- Develops business analytics foundation through machine learning for data analysis.
- Students will be able to enhance their skills in data analysis, Python programming for machine learning and Python/ R programming for statistical methods.
- They will also be able to find answers to the questions they don't know the answers to.
- It will help them to adapt to the automated future of business intelligence.

SYLLABUS

Theory and Practice

Unit I: Fundamentals of Data and Analytics, Overview of data types, sources, and collection methods for business applications, Basics of data analytics, Role of data in driving business intelligence and decision-making. (12 hours)

Unit II: Machine Learning for Business Intelligence: Introduction to machine learning concepts and algorithms for business, Building predictive and classification models for business decision support, Applications of machine learning in forecasting, optimisation, and customer insights. (15 hours)

Unit III: Data Analytics for Business Functions: Applications in product strategy, sales, marketing, consumer behaviour analysis, Financial decision-making using advanced data analytics techniques, (12 hours)

Unit IV: Advanced Applications of Business Analytics: Data analytics for

digital and social media strategy, including content optimisation, Innovation and entrepreneurship supported by analytics-driven insights, Operational analytics for supply chain management, logistics, and resource allocation. (12 hours)

Practical Component **(60 hours)**

1. Collect data from open business datasets (e.g., Kaggle, UCI) and perform data cleaning and preprocessing using Python (Pandas).
2. Perform basic descriptive statistics and data visualisation to understand business trends.
3. Use regression algorithms to predict future sales based on historical data.
   Apply classification models (e.g., Decision Trees, Logistic Regression) to segment customers.
4. Forecast product demand using time series data and ARIMA/exponential smoothing.
5. Use association rule mining (Apriori algorithm) for cross-selling and product bundling.
6. Perform customer segmentation using K-means clustering for targeted marketing.
7. Analyze financial statements and build a model to predict credit risk.
8. Analyze Twitter or YouTube comments to assess public sentiment towards a brand or product.
9. Supply Chain Optimisation Using Analytics through real-world problems.

Essential/recommended readings

1. Sherman, R. (2014). Business intelligence guidebook: From data integration to analytics. Newnes.
2. Negash, S., & Gray, P. (2008). Business intelligence. *Handbook on decision support systems 2*, 175-193.
3. Moss, L. T., & Atre, S. (2003). Business intelligence roadmap: the complete project lifecycle for decision-support applications. Addison-Wesley Professional.
4. Chaudhuri, S., Dayal, U., & Narasayya, V. (2011). An overview of business intelligence technology. *Communications of the ACM*, *54*(8), 88-98.
5. Minelli, M., Chambers, M., & Dhiraj, A. (2013). *Big data, big analytics: emerging business intelligence and analytic trends for today's businesses* (Vol. 578). John Wiley & Sons.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.